ART. XXVII.—1. *The Anatomy of the Human Lung;* an essay, for which was awarded the Fothergillian gold medal of the Medical Society of London. By A. T. HOUGHTON WATERS, Member of the Royal College of Physicians of London, &c. &c. London: John Churchill, 1859. pp. 233.

2. *On the Intimate Structure, and the Distribution of the Bloodvessels of the Human Lung.* By A. T. H. WATERS, M. R. C. P., &c. (From the Proceedings of the Royal Society for May 26, 1859. Communicated by Dr. Sharpey.) pp. 12.

LABOURS in this direction are far from being works of supererogation. Minute anatomy has but commenced its labours; and there is, perhaps, no one important viscus which may not profitably be made, at the present time, the subject of new investigations. In all these cases the incomplete state of our knowledge is not, as some suppose, owing to the imperfect condition of the optical instruments which have become necessary to this branch of research; rather is it, at least in the vast majority of cases, the result of the difficulties which surround the primary procedures by which the tissues submitted to study are prepared for the microscope. And it is precisely because the difficulties are of this character, and therefore likely to be overcome by the inventive abilities of individual observers, that so rich a field is here opened to minute anatomists.

In the case of the lung a number of unsettled points are presented for investigation. Prominent among these is the question of the existence of an epithelium in the air-vesicles of the lung, and that of the precise anatomical relations of the bronchial to the pulmonary arteries. Of these questions the first, apparently insignificant in itself, swells to very considerable proportions in consideration of that doctrine of pulmonary tubercles now in the ascendant, originated by Schrœder van der Kolk and indorsed by Virchow and Paget, according to which these bodies are believed to result from certain metamorphoses of the cells of the epithelium of the air-vesicles; a doctrine which at once loses all probability of truth if it can be shown, as taught by Rainey, Todd, and Bowman, that no such epithelium exists.

The first of the two papers above named contains the results of a series of carefully made original studies of the external and microscopical anatomy of the lung. The second contains a summary of the author's conclusions upon the prominent disputed points, and is a mere abstract of the more novel matters presented in full by the first.

A careful perusal of these papers has satisfied us that the author deserves every credit for the patience with which he has pursued his studies, for the clearness of his descriptions, and the care devoted to the obscurer parts of the matter; so that although the essay is very far from exhausting the subject, it yet presents much that is of great general interest, and may be regarded upon the whole as a valuable contribution to the literature of this portion of human anatomy.

It would be vain to expect a writer on minute anatomy at the present day to fulfil his task without the introduction of at least some new names, and accordingly in the description of the minute arrangement of the ultimate pulmonary tissue we find our author bringing forward his quota to add to the already confused nosology of the subject. The following extracts from the paper read before the Royal Society will sufficiently indicate his views of the lung structure:—

"The bronchial tubes of the lungs, after several divisions and subdivisions, which for the most part are of a dichotomous nature, terminate in a dilatation into which open a number of elongated cavities, which constitute the ultimate expressions of the air-tubes. These elongated cavities, to which various names have been given, I propose to call *air-sacs*, as being, in my opinion, more appropriate to their shape and arrangement than any term hitherto used; and the series of air-sacs connected with the extremity of each bronchial twig, with its system of bloodvessels, &c., I shall call a *lobulette.*" "Each lobulette consists of a collection of air-sacs, which vary in number from six to eight, ten, or twelve."

"The air-sacs are somewhat elongated cavities," the walls of which "have in them a number of small, shallow, cuplike depressions, separated from each other by portions of membrane which are more or less raised and project into the interior of the sac." These depressions are called "*alveoli*," a term adopted by our author from Rossignol.

The portions of pulmonary tissue designated as "air-sacs" by Mr. Waters have been especially successful in obtaining names; thus they have been called "intra-lobular bronchial ramifications" by Addison, "lobular passages" by Todd, "intercellular passages" by Rainey, "infundibulums" by Rossignol, "Malpighian vesicles" by Moleschott, and "terminal cavities" by Mandl.

Mr. Waters' descriptions of these parts present little that is novel except the two new terms "air-sacs" and "lobulettes;" but the accounts he gives are so evidently drawn from direct observation, they are so clear, and so readily understood, that his book becomes at once of considerable value to all who desire to acquire accurate information of the present state of knowledge on this subject. It has also another, and we may say a higher value than this; it contains the views of a careful and independent observer on the one side or the other of the several disputed points presented by the subject, and it is therefore a new step on the road towards the ultimate determination of the truth of the matter. Among these disputed points perhaps the most interesting is that of the existence of an epithelium lining the air-cells. (The air-cells or air-vesicles of most of the text-books are the "*alveoli*" of the "*air-sacs*" of Mr. Waters.) On this head Mr. Waters adds his testimony to that of Mandl, Kölliker, Rossignol, and others: he says:—

"From careful and repeated examination of a very considerable number of specimens of the lungs of man, and various mammals, I have perfectly satisfied myself of the existence of an epithelium in connection with the walls of the air-sacs." The cells of this epithelium, though much smaller, are described as resembling those of the ordinary pavement epithelia. It is admitted on all sides that the ciliated epithelium of the bronchial tubes terminates at the point where they open into the *air-sacs.*

Another point at present disputed is the precise distribution of the bronchial arteries and their relation to the pulmonary vessels. Thus, for example, contrary to the general opinion, Dr. Heale expressed to the Royal Society of London his belief that the bronchial arteries "do not supply in the smallest degree any portion of the *bronchial mucous membrane.*"

As to this Mr. Waters states in his "conclusions:"—

"The *bronchial arteries* distribute their blood to the bronchi, the bronchial tubes, the vessels and areolar tissue of the lungs; the branches that enter the lungs pour their contents into the pulmonary veins."

His observations on the condition of the fœtal lung before birth possess very considerable interest; but it must be confessed the article on "the development of the lungs" throws no new light on this obscure subject.

It is a very great addition to the value of this book that it contains a detailed account of the processes made use of by the author in his investigations. Too often original observers omit all mention of their manner of working, which would otherwise serve as the starting-point of new studies.

Mr. Waters' book, however, is infinitely superior to the wood-cuts with which it is illustrated; these are truly execrable, especially those marked original, and in the verbal description which is appended to each, the author invariably omits to mention the magnifying power employed. J. J. W.

ART. XXVIII.—*Report on the Health of the Waterguard and Waterside Officers of Her Majesty's Customs during* 1858. By J. O. McWILLIAM, M.D., F.R.S., C.B., R.N., Medical Inspector of Her Majesty's Customs. London, 1859.

THE report before us, for a copy of which we are indebted to the author, was presented to the Parliament of Great Britain in the spring of 1859, in connection with the Third General Report of the Commissioners of Customs.

Dr. McWilliam gives a highly favourable account of the health of the officers of customs stationed at the docks and along the wharves of London, during the year 1858, as well in relation to previous years as in comparison with other bodies of men.

The number of cases from the waterside and waterguard services admitted to medical treatment was, we are told, 1,118 in 1857, but only 941 in 1858. The daily average of sick was only 20.69 in the waterguard, and 7.86 in the landing department, against 23.1 and 8.6, respectively, in the previous year. The deaths from all causes in the waterguard, which were 1.3 per cent. on an average of the previous eleven years, and 0.7 per cent. in 1857, had fallen to 0.49 in 1858. The mortality in the waterside department had slightly increased.

The small amount of sickness and the low rate of mortality that were observed among the tide-waiters and watermen of the British revenue service, during the year 1858, are curious and interesting facts on two accounts. In the first place, the number of deaths among the entire population of London, as shown by the report of the Registrar-general, was, for the year 1858, greatly above the average; and in the second place, the extreme heat of the weather during part of the summer, and the very offensive state of the river Thames, and the different docks on or about which the several revenue officers are constantly stationed, led to a general apprehension of a great increase of sickness among all who were exposed to these deleterious influences. But, from the report before us, we learn that the ordinary degree and kinds of illness were not only in no way enhanced by the influences referred to, but even underwent a marked diminution; and secondly, that the cases of bowel complaints, which are usually considered specially attributable to offensive miasmata, were even below the average during the period in which the weather was hotter, and the Thames more nauseous than on any previous occasion.

In presenting to our readers the substance of Dr. McWilliam's report, we shall follow, as far as a due regard to conciseness will admit, the language of the author.

Of the matters discharged from the sewers into the river Thames, part, it appears, floats upon the surface, part is at once precipitated, part is dissolved, and part is held in suspension. Of the latter a part is ultimately deposited after acquiring sufficient gravity by maceration. To the precipitation of the sewage mud, when the water is in a quiescent state, at the sides of the river, in what he calls "the retrogrades and brattice cesspools," Mr. Gurney is inclined to refer the pollution of the Thames.

Any body or material capable of flotation or suspension in the water of the river, as are parts of the sewage of London, undergoes a long process of upward and downward movement before being finally carried to the sea. The degree of upward oscillation is increased in proportion with the strength of the spring tides, while during neap tides the downward or seaward movement is the greatest. The extent of these movements upwards and downwards is modified by the various circumstances which influence the duration of the flood and ebb tides respectively, and by the part of the river into which such bodies are cast. Still, the ultimate result of the series of oscillations is a tendency seaward, which, although slow, probably not more than five miles in a fortnight, is certain. It is thus that a large quantity of London sewage, floated, dissolved, and suspended, finds its way to the sea.

In June, 1858, the river is described as presenting a most unusual appearance. Being of a dark slate colour, thick and turbid, and emitting a most offensive smell, particularly at low water, when the banks, more or less polluted from the contents of sewers, were acted upon by high temperature; and during the last two or three hours of the flood tide, when the water fully saturated with sewage and stirred up mud, was disturbed by passing steamers. This condition of the river lasted until about the middle of July, and in a less degree from then until the end of September, when the river resumed its normal state. In the London and the St. Katherine's docks the water was even darker coloured than in the river, in consequence of the thick black mud—mineral and organic—on the floor of the dock, the rapid precipitation of which was favoured by the comparatively quiescent state of the water within the docks. In the Surrey, Commercial, and East and West India docks, the stench was not at any time so great as to cause much complaint, but in both the London and St. Katherine's it was equal to that of the river.

The state of the river and docks during the months of June and July, 1858, was such as to excite considerable anxiety, and it was seriously apprehended that the metropolis was on the verge of a most pestilential endemic. Fortunately this dismal anticipation was not realized. While the emanations from the river and docks gave rise to much annoyance and just complaint, there was no reason, we are assured by Dr. McWilliam, for believing that they were productive of disease, most certainly not of those forms of disease which are generally ascribed to miasms evolved from water in a state of pollution, or from mud containing organic matter that is undergoing the various putrefactive changes.

The duties of Dr. McW. as medical inspector led him to watch closely for any unfavourable influence, which the condition of the river might exert upon the health of the revenue officers under his charge. The waterguard, in number upwards of 800, may be said to live on the river, or in the docks, in ships, or in barges and open boats; while the waterside officers, numbering upwards of 500, are employed during the day in the docks, or at the various wharves of the bonded warehouses on each bank of the river. Among the causes which, by lowering vital power and inviting disease, exert a prejudicial influence upon the health of the waterguard officers, are enumerated in the report before us, exposure to vicissitudes of weather by night as well as by day, irregular and often an unusual kind of diet, occasionally indifferent and sometimes very bad accommodations, and now and then long fasting. Among the causes which operate in the contrary direction, by increasing the power to resist morbific agencies, are included the circumstance that the duties of a large portion of the waterguard call them to Gravesend, and to various other distances down the river, where the atmosphere is comparatively pure; and, also, the salutary effect of discipline upon the life and general habits of the officers of this department.

To show relatively to other years the state of health among the different revenue officers, during the hot months of 1858, three tables are given, showing, 1st. The number of sick from all causes during the months of June, July, August, and September, 1855, '56, '57, and '58; 2d. The numbers daily sick; and 3d. The number of cases of bowel complaints for the same periods.

From these tables it appears that the total number placed on the sick list from all causes during the four hot months of 1858, although slightly in excess of those sick at the same period in 1855 and '56, was below the average of the three previous years, and considerably lower than in the year 1857, when the river and docks were certainly offensive, but far less so than in 1858. As respects bowel complaints, including diarrhœa, ordinary and choleraic, dysentery, etc., the types of those forms of disease commonly supposed to be produced by noxious exhalations, the additions from these during the hot months of 1858 were 26.3 below the average of the corresponding period of the three previous years, and 73 less than in 1857. The number daily sick was also below the average, although there were several cases of rheumatism, phthisis, and other disorders on the list during nearly the entire year.

Although it may be said that the number of persons from which these results are derived was too small to warrant any general deduction, still the experiment, upon, it is true, a contracted scale, was made under circumstances as free from fallacy as can well be in a case of the kind; and, so far as it went, was well calculated to test the alleged morbific influence of the river effluvium. Of the whole force—between 1,300 and 1,400—much the greater number were exposed to the effluvium at its very source and fountain head. No one could leave duty without his absence being accounted for, and any attack of disease necessitating absence was at once inquired into.

According to the reports of the registrar-general, the year 1858 was an unhealthy one for London; but the mortality in spring and summer was below the average, the excess of deaths having taken place in the six cold months. From the same source we learn that diarrhœa and summer cholera were, in London, "perceptibly less fatal than usual." In the three summer months of 1857, the deaths from the first of these complaints were 2,343, and from the second 177; while the respective numbers for the quarter ending September 30, 1858, were 1,391 and 90.

"While," Dr. McWilliam remarks, "it is not only admitted, but urged, that miasms and foul emanations, from whatever source arising, call for the immediate employment of every means of prevention or mitigation which science or art can suggest, and that the legislative and other investigations into the condition of the Thames during the summer of 1858 were fully demanded by the occasion; it is nowhere sustained by evidence that the stench from the river or docks, however noisome, was in any way productive of disease. On the contrary, there was less disease of that form to which foul emanations are supposed to give rise than usual."

D. F. C.

ART. XXIX.—*On Excision of the Knee-Joint; illustrating the principal complications which are likely to arise after the performance of that operation, and especially the want of subsequent development and growth in the limb of the young subject.* By OLIVER PEMBERTON, Surgeon to the General Hospital, and Lecturer on Surgical Pathology at Sydenham College, Birmingham. Reprinted from the British Medical Journal. London, 1859, pp. 32.

EXCISION of the knee, in preference to amputation of the thigh, in cases of disease of the tibio-femoral articulation, has been for a number of years past, in England, an operation to which much attention has been directed, and upon which, in consequence, much has been written. The profession is, therefore, at the present time prepared to form certain conclusions in regard to it.

In a case where, from disease of the knee-joint which has resisted all his means of cure, the patient must soon die if the diseased parts remain, the surgeon is of course in duty bound to remove them, provided, as is always understood, the operation itself be not attended with too great risk to life. There are two ways in which this may be accomplished: the joint may be excised, or the thigh may be amputated. In making his choice between these two operations he should be guided by their safety, and also by their after results; that is to say, by the respective advantages of a stump, or of a shortened limb.

As regards the safety of the operation for excision of the knee, we learn from the recent publication of Mr. Price, from which we had occasion to quote in a notice of Mr. Sansom's "Mortality after Amputations," in the last number of this journal, that out of 160 cases of excision of the knee, collected from all British sources, both metropolitan and provincial, 32 died, or 1 in 5. Mr. Bryant, in a paper, an abstract of which was given in the July number of this journal for last year, informs us that out of 167 cases of pathological amputation of the thigh, performed at Guy's Hospital, 18 p. c. were fatal, or 1 in 5½. It should be added, moreover, that in amputations of the thigh for chronic disease of the knee-joint, or those in which excision might be thought of, only 1 case out of 7 proved fatal. Now, when we take into account the notoriously great fatality attending operations in a city hospital, we think ourselves right in concluding that excision of the knee-joint is at least equally fatal with amputation of the limb. We must not lose sight, moreover, of the fact that in 17 of the cases, marked as recovered from excision, amputation became afterwards necessary. So much for the safety of these operations; at least so far as we may judge from experience.

As regards the utility of the limb preserved by excision of the knee, we have had until now very imperfect means of coming to any definite conclusion. The information it affords upon this interesting question renders the publication before us, of Mr. Pemberton, one of considerable importance. It contains the detailed history of a case, in which the operation was performed by Mr. Pemberton, with an account of the condition of the patient six years afterwards, and also what might be called the ultimate condition of several patients who had been operated upon by other surgeons.

In the case of Mr. Pemberton, two inches and a half of the femur, and an inch of the tibia, were removed from a boy, twelve years of age. Eight months subsequently the wound had entirely healed, the union between the bones was of a ligamentous or fibrous character, admitting of free movement in any direction, the difference between the two limbs exactly corresponded to the amount of bone removed, namely, three inches and a half, and the patient could walk with the aid of a stick and a high-heeled shoe, the knee being supported by a leather case. Six years afterwards, Mr. Pemberton had an opportunity of examining his patient. He had grown in height and had thickened considerably in figure, but was somewhat diminutive for his age. The lower limbs presented a wonderful contrast in appearance; the one was strong, with the muscles, bones, and joints well defined; the other feeble and blighted. The sound limb, from the anterior superior spinous process of the ilium to the outer malleolus, measured thirty-four inches; the one subjected to the operation, twenty-five! There was, therefore, a difference of nine inches; or a deficiency in growth, as compared with the other, of rather more than five inches since the operation. The limb, Mr. Pemberton says, "could not be deemed otherwise than an incumbrance, and, with the best appliances to remedy the want of length, proving, after all, little better than a sad deformity."

Mr. Butcher, the well-known enthusiastic advocate of excision of the knee, in his memoir declares that it has been proved, by several instances, that the growth of the limb was not checked by excision of the joint in childhood. He quotes in support of this statement, among other observations, those of Dr. Keith, of Aberdeen, Mr. Page, of Carlisle, and Mr. Jones, of Jersey. Mr. Pemberton wrote to these gentlemen, and from what he learned from them, he concludes that "this most undaunted surgeon (Mr. Butcher) has, he fears, been led to adopt those conclusions in the question which his wishes and anticipations too clearly held in view."

Dr. Keith says, in his answer, that though when he had sent the history of his case to Mr. Butcher, three years before, no increase of disproportion in length had at that time taken place between the two limbs; yet now, three years afterwards, the operated limb, compared to the other, seems a mere appendage to the body; from the anterior superior spinous process of the ilium to the heel there is a difference of *seven inches* in the two limbs. This patient, at the time Dr. Keith wrote, was in his fifteenth year; at the operation only one inch and three-quarters of bone had been removed, and anchylosis had taken place.

In the case of Mr. Page, the patient was too old to judge of the effect of the operation upon the growth of the limb. From Mr. Jones no answer was received, on account of the letter having arrived at Jersey at the time of the calamitous fire in the General Hospital.

The case of Mr. Keith, however, together with his own, is sufficient to show that, whether anchylosis takes place or not, after the operation of excision of the knee in children under puberty, the growth of the limb is most seriously interfered with.

Excision of the knee must, therefore, as we learn from experience, be considered as at least equally fatal with amputation of the thigh; and in children, as leaving a limb which in the course of time will become an incumbrance. Most fortunate is it, therefore, when having such an alternative before him, as no limb at all, or worse than none, that the surgeon is able to rest assured that no operation whatever is necessary in the vast majority of cases, and that under proper care and attention almost any case of knee-joint disease in a young child will get well. It is much to be regretted, it is but right to add, both on their patient's account and on their own, that this has been so often forgotten of late years by British surgeons. Of course, as was said before, cases of disease of the knee-joint occasionally occur when, to endeavour to save life, the surgeon must remove the diseased parts; but these cases are exceedingly rare, and when they do occur, we ourselves should deem it preferable, both from motives of safety and on account of the ultimate result of the operation, to amputate at the thigh.

After having considered the effect of excision of the knee-joint upon the after growth of the limb, Mr. Pemberton proceeds to the narration of six other cases, in which he has performed the operation. Some of these cases exhibit the ordinary, and others the least frequent, complications by which it is attended. After their perusal, we cannot but express our astonishment that he could declare, as he does at the beginning of this publication, that "no surgeon, at all acquainted with the amount of shock, of hemorrhage, and other attendant circumstances of excision of the knee, will contend for one moment that the same danger to life in general follows its performance, as does amputation of the thigh." It would seem that his own personal experience, leaving aside that of the mass of the profession, should have prevented such a declaration.

In the first of these cases, the patient was a boy, seven years of age, whose left knee had been diseased for two years. The joint was excised, and the child died nineteen days after the operation of purulent infection. The second case was that of a boy, nine years of age, who suffered no pain on movement or on pressure; but the limb was useless, wasted, and in a semi-flexed position. In the hope of obtaining a more useful limb the joint was excised, and three days afterwards the patient died, having never rallied from the shock of the operation. It may be added that here, as in all the cases, chloroform was administered. The third case was a woman of thirty, who died three months after the operation, as it is said, under the wasting influence of diseased lungs. At the post-mortem examination, where the operation had been performed, pus was found burrowing its way in all directions. The fourth case was a girl, seventeen years of age; the operation here does not seem to have afforded much, if any, relief, and when she left the hospital, ten months afterwards, the soft parts over the tibia were swollen and thickened, containing one or two sinuses, and the thigh-bone, as high as the trochanter, was greatly enlarged, and had three or four sinuses leading to it. The fifth case was a man, twenty-seven years of age, who, after nearly losing his life from arterial hemorrhage from the slipping of a ligature from the superior external articular vessel, left the hospital on crutches, the joint incased in a splint, in a most unsatisfactory condition, to have the benefit of fresh air, four months and a half after the operation. The last case was a boy of thirteen; in this, at the expiration of eight weeks, the wound was completely closed, and the bones had become firmly anchylosed.

Surely, after the perusal of these cases, it is strange that any one in whose hands they had occurred should feel inclined to advocate excision of the knee. We have no hesitation in declaring, moreover, that in no one of them can we consider the operation for the removal of the diseased parts to have been imperatively demanded. The second case, particularly, can scarcely be read without a shudder; the patient was suffering no pain, all acute disorder had subsided, he was walking on crutches and had done so for years, but "*at the urgent request of the boy's friends*" a most dangerous operation is performed, and in three days he is dead. The friends may plead the excuse of ignorance in a case like this; but what answer can the surgeon, upon whom the whole responsibility of an operation rests, give to himself? Whenever we see the plea, unhappily a most common one, that such an operation was performed on account of the solicitations of a patient, or of his friends, we invariably think of the old French proverb, *qui s'excuse, s'accuse.*

We heartily thank Mr. Pemberton for the information he has given us in this little publication, which is ably written, and neatly illustrated by several wood engravings.

W. F. A.

ART. XXX.—*On the Coagulation of the Blood in the Venous System during Life.* (A Thesis for a Medical Act in the University of Cambridge.) By GEORGE MURRAY HUMPHRY, M. D., F. R. S., etc. etc. Macmillan & Co., Cambridge and London. 1859. 8vo. pp. 42.

It is well known to those who are much in the habit of making post-mortem examinations, that it is often a matter of much difficulty to determine whether coagula found in the bloodvessels have been formed before or after death. When the fatal disorder has been an exhausting one, and the dissolution gradual, so that there has been in the latter stages a failure of the powers keeping up the circulation, the clots are apt to be extensive and fully formed. And from an analogous condition of things, but insufficient in degree to destroy life, an analogous phenomenon may arise in those portions of the vascular system where the current of blood is moved with least energy. Such an occurrence, in Mr. Humphry's opinion, is not unfrequent; he details a number of cases in illustration of it.

The first of these cases is a very interesting one. A medical man was recovering from an exhausting attack of pleurisy on the right side, when uneasiness and stiffness came on in the left groin, and gradually extended down along the whole course of the veins of the limb, which became œdematous; after a time the symptoms subsided, but commenced in the other limb, the popliteal vein being the starting-point, and the lesser saphena and femoral veins becoming involved. This was in 1843. Similar but slighter attacks followed two subsequent illnesses in the same patient; typhoid fever in 1846, and pleurisy on the left side in 1851.

Mr. Humphry attributes the formation of these clots to "a preternatural tendency to coagulation in the fibrin." He thinks that they are altogether unconnected with inflammation, and unproductive of it; moreover, from the smooth exterior they present, except where adherent to the inner surface of the vessel, he is somewhat inclined to doubt Virchow's embolic theory.

With regard to the preternatural tendency to coagulation, above alluded to, our author explains it upon the view defended by Dr. Richardson in his essay on the cause of the coagulation of the blood. "The fibrin," says he, "is held in solution by the presence of ammonia, and its tendency to coagulate in the body is increased, and its coagulation out of the body is accelerated by a diminution of the volatile alkali of the blood; and it is quite probable that, in the cases which we are discussing, an insufficient quantity of this solvent medium is one of the proximate causes leading to the clotting of the blood in the vessels." Following out this idea, Dr. Humphry recommends the administration of ammonia where a predisposition to the formation of clots seems to exist. But, in the first place, while the merits of Dr. Richardson's essay are very highly estimated, his conclusions have by no means met with unqualified assent; and in the second place, we are uninformed as to the precise circumstances which indicate the tendency to the formation of clots.

The second part of this essay is allotted to coagula formed in the pulmonary artery. Seven cases in which these were observed are related; in three of these instances death was directly traceable to the presence of the coagula. A remarkable fact is that life could be maintained at all with such obstructions in so important a canal.

Clots in the cerebral sinuses are next considered, and an illustrative case given, in which no other cause of death could be clearly assigned. We are tempted here to allude to an autopsy recently made by us, in which, among other morbid appearances, the basilar and right carotid arteries with their branches were distended with tolerably firm reddish clots. The aspect and consistence of these coagula were such as to indicate that they had been formed for some time previous to death; the vessels containing them were atheromatous. Although not altogether relevant, this case may perhaps be of interest as complemental.

Lastly, Dr. Humphry speaks of the clotting of the blood in the cavities of the heart; relating the case of a girl eleven years of age, whose death took place from this cause while she was undergoing treatment for a severe burn. He takes occasion here also to allude to the mode of formation of coagula in the heart and large vessels after death, the fibrin accumulating at the periphery so as to form a tubular sheath for the later portion of the clot.

The subject of this very interesting essay has, as its author remarks, attracted a good deal of attention of late years; it is, however, one which is very apt to be overlooked, in the making of post-mortem examinations as well as in clinical practice, on account of the greater relative importance assigned to changes in the other viscera. Dr. Humphry's pamphlet will, we hope, be of use to a great many observers, by inducing them to investigate more closely the pathological changes of which it treats.

A paper on "Obliteration of the veins, and its influence in the production of partial dropsies, with considerations in regard to passive dropsies in general," published by Bouillaud in 1823 in the *Archives Générales de Médecine* (first series, vol. ii. p. 188), may be read with interest and advantage in connection with the one which has formed the subject of this notice. J. H. P.

ART. XXXI.—*The Action and Sounds of the Heart: a Physiological Essay.* By GEORGE BRITTON HALFORD, M. D., Member of the Royal College of Physicians of London, etc. London: John Churchill, 1860. pp. 47.

DR. HALFORD's pamphlet has for its object the solution of one of the most vexed questions in physiology. It is divided into two parts: one on the action of the heart, the other on the cause of its sounds. The author starts with the objection to the results obtained by previous inquirers, that all observers, from Harvey downwards, have first removed the pericardium, the effect of which is to give to the heart an unequal and uncertain motion. In prosecuting his researches, the viscus was exposed without injuring the pericardium, and its movements studied through the transparent membrane. The experiments were made on asses and dogs, and they led to the conclusion that there exists a compensation between the auricles and ventricles; and that although the cavities of the organ are constantly receiving and discharging their contents, their movements are so regulated that the bulk of the circulating fluid inclosed by the pericardial sac is always the same. When the pericardium is removed the contractions appear more forcible, and the sounds are much louder, from which it is inferred that the membrane regulates the movements of the organ it surrounds. Of the impulse, and the functions of the auriculo-ventricular valves, it is stated that the first is systolic, and that the valves are closed before and independently of the ventricular systole. To explain it in the words of the author: "The auricles contracting on the blood, the force of their contraction is transmitted by the blood in all directions, separating the flaps of the valves, distending the ventricles, and (the semilunar valves being shut down) pressing as much upwards and backwards as downwards and onwards. The force, not being sufficient to raise the semilunar valves, is expended in distending the ventricles, and raising and closing the auriculo-ventricular valves." Respecting the action of the papillary muscles during the ventricular systole, it is held that by contracting simultaneously with the ventricles they keep the auriculo-ventricular valves in position, and prevent their eversion into the auricles. This view is identical with that of John Hunter, and similar to the one defended by Weber in his notes to Hildebrandt's Anatomy.

In the second part of the pamphlet the author criticizes with ability the opinions of those opposed to the theory of the valvular origin of the heart's sounds. That the second sound is owing to the flapping back of the valves at the aortic and pulmonary orifices is nowadays the creed of the majority of intelligent physicians. But concerning the first, the opinions are as diversified and the arguments as plentiful as they are on the merits or demerits of special schools in painting, or of any subtle questions in metaphysics. Dr. Halford enters the list strongly in favour of the valvular origin of the sound. He interrogates the hearts of birds and snakes, and finds the sounds to differ according to the construction of the organ, especially according to the size and strength of the auricles, and the differences in size, shape, and structure of the auriculo-ventricular valves. He exposes the heart in dogs, and compresses the great veins that pour their blood into it with a pair of bull-dog forceps, and both sounds cease. He removes the pressure: they return. From his experiments, and the teachings of natural science, he therefore concludes that the first sound is exclusively due to the tension of the auriculo-ventricular valves by the backward pressure of the blood; an opinion emitted, if we mistake not, by Rouanet, and which certainly is ingeniously sustained by Dr. Halford.

J. DaC.

ART. XXXII.—1. *Series of Clinical Cases (with Observations) illustrating the Views recently put forward by Dr. Brown-Séquard, as regards certain points connected with the Physiology of the Nervous System.* By JOHN W. OGLE, M. D. Oxon, F. R. C. P., Assistant Physician to St. George's Hospital, Secretary to the Pathological Society of London. pp. 15.

2. *Cases brought before the Notice of the Pathological Society of London.* See *Transactions*, Vol. X. By Dr. JOHN W. OGLE. pp. 32.

3. *The Diaphemetric Compass; an Instrument for measuring the Degree of Discriminative Power, as regards Contactile Impressions, enjoyed by the Skin and Mucous Membranes in certain Affections of the Nervous System.* By JOHN W. OGLE, M. D., etc. pp. 11.

1. EVEN had Dr. Ogle not been already known to the profession as an able observer and writer, the first of the above-named memoirs would have commanded attention, from the great interest attaching to Dr. Brown-Séquard's researches. Many a reader will be glad to meet with a clinical exposition of the principles lately developed by this able physiologist, who, from various circumstances, would be unable to follow the different steps by which they have been reached. And even those who have been familiar with the experimental procedures and their results, upon which those principles are based, will be interested to find that bedside observation goes to confirm the conclusions arrived at by means of vivisections practised upon the lower animals.

Dr. Ogle thinks that his cases tend most materially to corroborate the following views:—

"(*a.*) That the posterior columns of the spinal cord do 'NOT' form, as was thought by Longet and many other observers, the means for the entire (*en totalité*) conduction of sensitive impressions to the brain; but

"(*b.*) That these columns form a medium to a slight extent only for the passage of sensitive impressions; such conduction along the spinal cord chiefly occurring in the central or gray matter of the cord, into which part the fibres of the posterior sensitive roots of the nerves, by means of transverse, ascending, and chiefly descending fibres, find their way almost immediately after gaining the cord, *viâ* the posterior columns, the posterior gray cornua, and, in part, the lateral columns. And that if there be any fibres conducting sensitive impressions ascending from the trunk or limbs along the entire length of the cord, their number must be very inconsiderable.

"(*c.*) That the fibres conveying sensitive impressions to the brain do not at any rate decussate at a point higher up in the cerebro-spinal axis than the pons Varolii.

"(*d.*) That the decussation of fibres conveying sensitive impressions must be of necessity not only at a part below the level of the upper margin or central part of the pons Varolii, but even for the most part, if not entirely, below the medulla oblongata itself. That is to say, this crossing or interlacement of sensory nerves must take place in the spinal cord itself, and that not in any particular spot, but in *every* portion of the cord, almost immediately after the entrance therein of the afferent fibres.

"(e.) That all the motor or efferent fibres decussate at a distinct point immediately below the pons Varolii—that is to say, at the anterior pyramids and the neighbouring parts—contrary to the views of Valentin, Cruveilhier, Longet, Foville, etc."

The first of the cases mentioned is that of a man, æt. 62, in whom a dislocation of the sixth cervical vertebra forwards caused the seventh to encroach upon the anterior portion of the spinal cord, the posterior columns remaining uninjured; and yet there was on the thirty-second day entire loss of sensibility as well as of motion in the lower limbs. Numbness and loss of power in these members had come on at about the third day. The exact period during which this want of sensibility lasted is not stated.

In the second case very firm malignant growths sprang from the dura mater, at the borders of the foramen magnum, in a woman, æt. 49; the foramen was so much blocked up as hardly to admit the tip of the little finger, and of course the white portions of the cord were subjected to severe pressure. Loss of power was observed first on one side and then on the other, but the skin retained its sensibility to pinching and pricking up to the very last.

The third case was one of accidental injury, the sternum and the body of the first dorsal vertebra being fractured, the latter, however, without displacement. Some blood was effused outside the membranes, opposite the last two cervical and the first dorsal vertebræ, and in this part of the cord the anterior columns and the gray matter were softened, the posterior columns remaining intact. The sensibility of the skin of the legs, although much blunted, had never been wholly lost.

Case fourth was that of a girl, æt. 18, in whom a cyst of some size occupied the right portion of the pons Varolii. In the *left* arm, leg, and side there was great loss of motile power and of sensibility to pricking and pinching. On the *right* side of the face and nose, and on the temple of the same side, there was numbness and diminished sensibility of the skin; and the conjunctiva of the right eye was unduly vascular.

The fifth case was not very fully recorded, and is introduced for the purpose of being further elucidated.

In the sixth case "two large rounded masses of firm scrofulous (?) material" occupied, one the centre and posterior part of the right portion of the medulla oblongata, projecting up into the fourth ventricle, the other the upper and right portion of the pons Varolii. The posterior parts of the crura cerebri were also softened, and one or two small scrofulous (?) deposits were met with in the posterior parts of the cerebral hemispheres. The patient, a girl æt. 18, had for about a year had numbness and coldness of the left arm and hand, headache, and oscillation of the eyeballs.

The seventh and last case is one of injury, a man æt. 28 having sustained a dislocation of the fourth and fifth cervical vertebræ, with laceration of the spinal cord, chiefly affecting the right side and the central portions of it; softening ensued. Motility was lost in both legs at the end of two hours, and sensibility to touching or pinching soon afterwards ceased not only in the legs, but in the right forearm. Priapism also existed. Death took place in seventy-two hours.

A mere glance will suffice to indicate the bearing of these cases upon the propositions which they are intended to illustrate. Several excellent wood-cuts add much to their value.

Dr. Ogle concludes this paper with some apt remarks in reference to the common defects in the mode of recording medical observations, saying, most truly, that accounts otherwise valuable are often rendered useless by omissions or vague expressions. He thinks that, in the present improved state of physiology and pathology, we are both enabled and called upon to use more care and precision in the clinical and *post-mortem* study of lesions of the nervous system than was formerly the custom. We should be glad to present a *resumé* of these remarks, but they are so condensed that it would be tantamount to quoting them entire.

2. In the second collection of cases named in the heading of this article we find matter of great interest. Five of the cases occurred in the human subject, and one in the horse; four of the former concerned the brain or its nerves, and the remaining one was an aneurism of the subclavian artery.

The first two of these cases, among other phenomena, presented abscesses within the brain-mass, and obstruction by blood-clots, to a greater or less extent, of the intra-cranial venous sinuses on the corresponding side. Dr. Ogle argues that the abscesses were *determined*—a different word from *caused*, and here as often elsewhere much more rational—by the hindrance to the return of blood from the brain; supporting his view upon grounds so substantial as to call for its further consideration. One of his foot-notes is of such importance that we are tempted to transcribe it:—

"I would here allude to the *in*frequency with which the various cranial sinuses are examined in *post-mortem* examinations. The superior longitudinal one should habitually be examined immediately on the removal of the skull-cap, and before the dura mater is divided; and the other sinuses after the removal of the brain. I may be, perhaps, pardoned for here alluding also to a common error often fallen into, and that is the examination of the organs of the chest before that of the cranial contents, a procedure which of course allows, to a great extent, of the emptying of the cranial veins and sinuses."

The third case was that of a boy, æt. 13, an epileptic, who died in consequence of extensive burns. He had always had a deficiency in temperature and in voluntary power on the left side, and the autopsy disclosed a very remarkable atrophy of the right hemisphere of the cerebrum, as well as of the left lobe of the cerebellum. The appearance of the brain is shown in a coloured lithograph. Both lateral ventricles were dilated, the right one enormously so; degeneration of the brain-substance, to a striking degree, was detected by microscopical examination.

Fifth in this series stands the case of a man servant, æt. 36, who had had ptosis on both sides, immobility of both eyeballs, dysphagia, and loss of power over the muscles of the mouth and upper extremities. Respiration was much impeded, and he ultimately died of apnœa. Disease of the upper surface of the sphenoid bone, supposed by Dr. Ogle to have been of a rheumatic origin, was the only morbid appearance detected by dissection, except fatty degeneration of the muscles in each orbit.

Dr. Ogle's case of right subclavian aneurism (he spells it aneur*y*sm, we think somewhat pedantically) presents several points of interest. The tumour attained an enormous size, and the ends of the fingers became clubbed and cyanotic. Sensibility and motile power were lost in the arm, evidently from pressure upon the axillary nerves. "The first rib was very greatly carious, and was partly, as it were, lying surrounded by blood-clot, within the aneurysmal sac." In the July number of this journal for 1858 we reported a case in which the upper piece of the sternum was found thus lying in the cavity of an aneurism of the aortic arch; in that case also the tumour had rapidly attained a very large size.

One case in this series remains to be noticed; it was that of a horse affected with "roaring," whose laryngeal muscles were found to be atrophied on the left side. In connection with this phenomenon, Dr. Ogle remarks on the modifications of the voice, cough, etc., of man, which may arise from paralysis of the laryngeal nerves; the recurrent laryngeal, he thinks, is the one most frequently affected in this way.

3. The diaphemetric compass described by Dr. Ogle is regarded by him as an improvement upon the means hitherto proposed, by Weber, Sieveking, and others, for the purpose of indicating the degree of tactile sensibility possessed by the skin of any part. It is about 4½ inches in length, and consists of a pair of mathematical compasses or dividers, one leg having a dial-plate at its upper extremity. Behind the centre of this dial-plate is a toothed wheel, carrying the indicator; a pinion attached to the other leg of the instrument turns the wheel, and the extent of the separation of the two legs will be shown by the motion of the indicator on the dial-plate. The working of the arrangement is obvious.

Dr. Ogle introduces his description of this instrument with a brief but interesting sketch of the researches of Weber, Allen Thompson, Lefévre, and others, upon the subject of tactile sensibility. But, with a candor not invariably displayed by inventors, he admits that these inquiries are possessed of but a limited degree of importance in a clinical point of view; the observer being often completely baffled by the mental state or habits of inattention, or even by the sheer stupidity, of the patient. In comparative measurements, in drawing plans, &c., such an instrument as above described may, however, be found to answer a useful purpose. J. H. P.

ART. XXXIII.—*Phthisis and the Stethoscope, or the Physical Signs of Consumption.* By RICHARD PAYNE COTTON, M. D., Fellow of the Royal College of Physicians, London, etc. etc. London: John Churchill. Second edition, pp. 80.

THIS is the second edition of a little work on the recognition of consumption, by the author to whom was awarded the Fothergillian gold medal of the Medical Society of London for a comprehensive volume on the nature, symptoms, and treatment of the same malady. It is evidently a faithful picture of what the writer has encountered at the bedside; and, freed as it is from unnecessary and tedious detail, will undoubtedly furnish an acceptable aid towards the detection of the formidable malady of which it treats.

We shall not, of course, attempt to give a summary of a book in itself a summary. We will merely state, in passing, that we heartily indorse the author's "unorthodox" opinions with reference to the value, or rather the want of value, of percussion in many cases of acute phthisis. So, too, as regards bronchophony; although we are sure that Dr. Cotton has overstated the case when he says that this most unreliable sign is perhaps of all the most commonly trusted to and most commonly employed. J. DaC.

ART. XXXIV.—*Lectures on the Diseases of Infancy and Childhood.* By CHARLES WEST, M. D., Author of "Lectures on the Diseases of Women;" Fellow of the Royal College of Physicians; Examiner in Midwifery at the Royal College of Surgeons of England; Physician to the Hospital for Sick Children; Physician-Accoucheur to, and Lecturer on Midwifery at, St. Bartholomew's Hospital. Third American from the fourth revised and enlarged London edition. Philadelphia: Blanchard & Lea, 1860. 8vo. pp. 630.

THE high estimate of these lectures we expressed on the appearance of the first edition has been fully confirmed by the unanimous voice of the medical profession. As a work of unquestionable authority in reference to the pathology and therapeutics of those diseases of infancy and childhood embraced in them they stand confessedly unsurpassed. They present far higher claims to our notice than as a mere digest of facts recorded by previous and contemporary writers. They are to be regarded, in a great measure, as constituting an original work. While the materials accumulated by others are freely made use of, none of them are appropriated that has not been carefully compared and tested by the author's own experience, acquired in the very favourable and ample field furnished to him by the Hospital for Sick Children in London. The conclusions presented by Dr. West in the lectures before us are based, we are assured, upon the result of nine hundred observations, and two hundred and eighty-eight *post-mortem* examinations, made among *thirty thousand* children who, during the past twenty years, have come under his care.

We have had frequent occasion to consult the lectures of Dr. West, and never without being most favourably impressed with the fulness, accuracy, and great clearness of the author's descriptions, the soundness of his pathological views, and the simplicity and excellence of his therapeutical directions.

In the edition before us all the lectures have been carefully revised, while large additions have been made throughout, to supply the deficiencies of former editions, and to bring up the entire course to a level with the present state of medical knowledge in reference to the subjects embraced in it. Some of the diseases incident to the early periods of life, it is true, remain still unnoticed, while among those embraced in the course some are treated of with much less fulness than others. Taken as a whole, however, the lectures of Dr. West will claim a high rank among the very best treatises on the maladies of infancy and childhood which have appeared in our own or any foreign language.

The lectures which in the present edition have received the largest additions are those on diphtheria, on the disorders of the mind, and on idiocy. The entire lecture (Lec. XVI.) in which the mental affections of early life are treated of has been considerably enlarged and improved; while the whole of it is highly instructive, it is, at the same time, replete with the deepest interest. The most important lectures of Dr. West's entire course are, however, those devoted to the diseases of the respiratory organs, as they occur in infancy and childhood. We know of no publication, indeed, in which the pathology and treatment of these important affections—affections, it may be remarked, which in very many of our States are of extremely frequent occurrence—are more fully and ably treated of. Their consideration occupies thirteen of the lectures (XVII. *to* XXIX. *inclusive*), occupying nearly one-third of the entire volume.

The publishers of the present American edition have appended two lectures published by Dr. West since the appearance of the work in England; one on "Sudden Death in Infants and Children," and the other on "Cerebral Symptoms independent of Cerebral Disease." Both of these subjects, upon which little, if anything, has been written, are of the deepest interest to the physician. They are treated by our author in his usually able and satisfactory manner. D. F. C.

Art. XXXV.—*Introductory Lectures, and Addresses on Medical Subjects, delivered chiefly before the Medical Classes of the University of Pennsylvania.* By George B. Wood, M. D., LL.D., President of the American Philosophical Society, President of the College of Physicians of Philadelphia, Professor of the Theory and Practice of Medicine, and of Clinical Medicine, in the University of Pennsylvania, etc. 8vo. pp. 460. Philadelphia: J. B. Lippincott & Co., 1859.

Upon the eve of his retirement from the office of public medical teacher which he has filled for many years, with great credit to himself, and to the entire satisfaction of his numerous pupils—when about to relinquish, for the time being, at least, the active duties of a medical practitioner, and to absent himself for a season from our midst—Dr. Wood could not have performed a task more acceptable to the large circle of his friends and admirers than the collection and publication of the introductory lectures and addresses on medical subjects delivered by him at various times and on various occasions. He could not have devised a more pleasing memorial of himself, in the view of those who have listened to his instructions during the term of their pupilage, or who have had the privilege of a personal intercourse with him, on a footing of reciprocal friendship, or in the rounds simply of professional intercourse.

Irrespective, however, of their value based simply upon the feelings of respect and esteem cherished for their author, the lectures and addresses of Dr. Wood recommend themselves to the notice of all who regard with favour whatever relates to the history, progress, and ethics of our profession. From them its younger members may acquire many a useful lesson, and even those of riper years cannot fail to find in them much to interest. We cannot, indeed, conceive it possible that any one, whether young or old, can rise without profit from the perusal of the matured reflections and deliberate conclusions of one who, like Dr. Wood, is so distinguished for his devotion to the true interests of medicine, for his efforts to raise it in theory and in practice, as a science and an art, to its proper rank, and to secure for it, as far as possible, that general respect and confidence it deserves, as well from its intrinsic excellence as from the blessings it is known to have already conferred, and which in the future it cannot fail to a still greater degree to confer, on the human race.

The volume before us, we feel confident, will be eagerly sought after by the medical men of the United States, and command a prominent place amid the most cherished works of their respective libraries, as a memento of one who, though no longer to be ranked as an active participant with them in the toils and responsibilities of a medical practitioner, will ever be held in great esteem for his worth as a man, his talents as a physician, and his successful career as a medical teacher and author. D. F. C.

ART. XXXVI.—*A System of Dental Surgery.* By JOHN TOMES, F.R.S., Dentist to the Dental Hospital of London, and to the Middlesex Hospital. With two hundred and seven illustrations. 8vo. pp. 686. Philadelphia: Lindsay & Blakiston, 1859.

DENTISTRY, although generally regarded as a distinct and even an inferior department of general surgery, claims a foothold upon the same physiological and pathological basis by which other branches of medical science are sustained. In many treatises on surgery, it obtains more than a mere casual mention; but its very importance forbids any attempt at its full discussion in such works. Mr. Tomes has for many years been known as a successful investigator of the healthy and morbid conditions of the teeth, and the very elegant volume before us affords the benefit of his labors to the world at large.

He says, in his preface: "In the following pages an attempt has been made to produce within the limits of a manual, a strictly practical work on dental surgery. In order to fulfil this object, it became necessary to enter upon the structure and development of the teeth and jaws in a limited degree only, and to leave untouched any historical account of the writings of those who have from time to time contributed to our knowledge in this branch of surgery. The diseases of the teeth, and of the parts subservient to them, together with the coincident maladies, have been treated of, so far as may be, in the natural order of their occurrence, and the structure and development of the tissues involved have been to some extent described before entering upon the diseases to which they are respectively liable. In a work devoted to the description of practical details, the modes of proceeding in the treatment of diseases, whether by operations or otherwise, must necessarily be those practised by the author."

Mr. Tomes's work is not divided into chapters, but the subjects are simply introduced in succession, under their respective headings. The development and irregularities of both sets of teeth, with the corresponding changes in the jaws, are first described. A serial collection of skulls was made by the author expressly for the purpose of elaborating this account, in the course of which are some very sound remarks, with quotations from Copland and West, upon the constitutional symptoms commonly ascribed to dentition.

A very clear and interesting account is given, under the next head, of the minute anatomy of the dental tissues; the diseases to which they are liable, with the appropriate treatment for each, are also detailed. Surgeons are, however, very seldom called upon to use any other operation for these diseases than that for the radical cure—extraction; so that the directions and illustrations here given will be of interest mainly to those who make dentistry their profession.

Many a country medical practitioner doubtless meets with cases, in which our author's section on extraction would be of great assistance. We are, however, surprised that Mr. Tomes, even avowing as he does his preference of the forceps